



U.S. Environmental Protection Agency

Region I New England
5 Post Office Square – Suite 100
Boston, MA 02109-3912

JUL 24 2015

CERTIFIED MAIL -
RETURN RECEIPT REQUESTED

Edward M. O'Brien, Mayor
City of West Haven
City Hall
355 Main St.
West Haven, CT 06516

Re: West Haven, Connecticut's Municipal Separate Storm Sewer System ("MS4")
Permit ID GSM000002
Request for Information Pursuant to Section 308(a) of the Clean Water Act –
Docket Number 308-01-15-031

Dear Mr. O'Brien:

The U.S. Environmental Protection Agency ("EPA") and the Connecticut Department of Energy & Environmental Protection ("CTDEEP") conducted an audit of the City of West Haven ("City"), Connecticut's Municipal Separate Stormwater Sewer System ("MS4") Program on April 8-9, 2015 to determine compliance with the state's General Permit for the Discharge of Stormwater from Small Municipal Separate Storm Sewer Systems, initially issued on January 9, 2004, re-issued on January 9, 2009 and January 9, 2013 (the "MS4 Permit"). The State's identification number for the City's MS4 Permit is ID GSM000002. The City has provided a response to the December 23, 2014 information request from EPA that addressed only the wet weather sampling requirements of the MS4 Permit. This current information request letter covers additional aspects of the MS4 Permit.

During the in-field portion of EPA's recent MS4 audit, EPA and City representatives visited the Department of Public Works ("DPW") garage and other municipal facilities and active new development projects locations within the MS4 during dry weather. EPA sent the City a follow-up letter dated June 26, 2015 regarding the state's General Permit for the Discharge of Stormwater Associated with Industrial Activity and federal oil pollution control regulations at the DPW garage. Section 6.(b)(2) of the MS4 Permit

states that in the case of a permitted municipal industrial activity that is covered by the General Permit for the Discharge of Stormwater Associated with Industrial Activity, the permittee may reference the activity's Stormwater Pollution Prevention Plan to address a portion of the permittee's Stormwater Management Plan. EPA offers the suggestion that the City may want to consider combining their response to the June 26, 2015 letter with the response to this current information request.

Section 308(a) of the Clean Water Act (the "Act"), 33 U.S.C. § 1318(a), authorizes the Environmental Protection Agency ("EPA") to require the owner or operator of a point source to provide information needed to determine whether there has been a violation of the Act.

The City is hereby required, pursuant to Section 308(a) of the Act, 33 U.S.C. § 1318(a), to respond to this Request for Information (the "Request") **within 30 calendar days** of receipt of this letter, except where noted otherwise. Please read the instructions in Attachment A carefully before preparing your response and answer each question in Attachment B as clearly and completely as possible.

Your response to this Request must also be accompanied by a certificate that it is signed and dated by the person who is authorized to respond to the Request. A Statement of Certification, Attachment C, is attached to this letter.

Information submitted pursuant this Request shall be sent both electronically and by certified mail, and shall be addressed as follows:

United States Environmental Protection Agency, Region 1
5 Post Office Square, Suite 100
Boston, MA 02109-3912
Attention: Alex Rosenberg (OES04-04)
rosenberg.alex@epa.gov

And

Connecticut Department of Energy and Environmental Protection
BWM/WPED
79 Elm St
Hartford, CT 06106-5127
Attention: Chris Stone
stone.chris@CTDEEP.gov

Should you have questions about any of the requirements listed above please contact Alex Rosenberg at (617) 918-1709 or via email at rosenberg.alex@epa.gov. Legal questions may be referred to Jeffrey Kopf, Senior Enforcement Counsel, at (617) 918-1796 or at kopf.jeff@epa.gov.

Sincerely,



James Chow, Manager
Technical Enforcement Office
Office of Ecosystem Stewardship
U.S. EPA Region 1

Cc: Vincent Amendola, Jr., Corporation Counsel, City of West Haven
Abdul Quadir, Chief Engineer WPCA
Alex Rosenberg, Compliance Officer, EPA Region 1 (electronic only)
Jeffrey Kopf, Senior Enforcement Counsel, EPA Region 1 (electronic only)
Stacy Pappano, CTDEEP
Kim Hudak, CTDEEP

Attachment A

Information Request

1. Provide a separate narrative response to each and every question and subpart of a question set forth in this Request. Precede each answer with the text and the number of the question and the subpart to which the answer corresponds.
2. If any question cannot be answered in full, answer to the extent possible. If your responses are qualified in any manner, explain.
3. Any documents referenced or relied upon by you to answer any of the questions in the Request must be copied and submitted to EPA with your response. All documents must contain a notation indicating the question and subpart to which they are responding. If the documentation that supports a response to one item duplicates the documentation that supports another item, submit one copy of the documentation and reference the documentation in subsequent responses.
4. If information or documents not known or not available to you as of the date of the submission of the response to this Request should later become known, or available to you, you must supplement your response. Moreover, should you find at any time after the submission of your response that any portion of the submitted information is inaccurate or incomplete, you must notify the EPA of this finding as soon as possible and provide a corrected response.

Attachment B

Questions

1. Provide an organization diagram for the City of West Haven that shows all City Departments, including the Department of Public Works, Planning and Development Department, Department of Public Health and individuals that are involved with MS4 Permit compliance. Describe the responsibilities of each department and individual included on the organization diagram with respect to MS4 Permit compliance.
2. Provide a copy of the City's current Stormwater Management Plan ("SWMP") as required pursuant to Section 5.(b) of the MS4 Permit. If the City does not have a current SWMP, provide a schedule for when the City will have one completed.

Illicit Discharge Detection and Elimination (IDDE)

3. Permit Section 6.(a)(3)(A)(i) requires the City to implement an illicit discharge ordinance. List all instances where the City has utilized the ordinance in an MS4 enforcement context since July 1, 2010. If the City has not used the ordinance in such a manner, explain why it has not done so and whether other regulatory measures are available and have been utilized by City staff for enforcing MS4 requirements.
4. Permit Sections 6.(a)(3)(B)(i)-(ii) require the City to have developed a series of maps depicting all stormwater discharges from pipes or conduits with a diameter of 12 inches or greater and the name of the waterbody and watershed into which each discharge flows (Note that in the case of West Haven, the City's entire MS4 is within its urbanized area and therefore the 12 inch diameter threshold applies to all outfalls when determining which must be mapped). Provide an outfall and stormwater infrastructure map demonstrating compliance with the MS4 Permit's mapping requirements. If the City does not have a map that depicts the location of all of its stormwater outfalls, provide a date by which the City will have one completed.
5. Permit Section 6.(a)(3)(B)(iii) requires the City to implement and enforce a program to detect and eliminate illicit discharges.

Describe what the City has done to implement a program to detect and eliminate illicit discharges, and provide a written copy of the documents that comprise the program. Submission of a written IDDE Plan that includes a protocol for detection and elimination of illicit discharges would constitute a thorough response to this question. If no such written program exists, provide

a schedule that explains the process and specifies the date(s) by which the City plans to create and implement such a program. Attachment D provides a recommended framework for illicit discharge detection that can be conducted at stormwater outfalls, as well as upstream within the MS4.

6. Explain whether the City has conducted any IDDE investigations and provide the following information for each IDDE investigation that the City has conducted since May 1, 2010:
 - a. The basis for the City suspecting the presence of an illicit discharge (including dry weather flow), and when the City became aware of this information;
 - b. The City MS4 outfall from which the suspected illicit discharge was released or continues to be released;
 - c. The water body to which the City MS4 outfall discharged or discharges, the Surface Water Classification for the waterbody, and whether a Total Maximum Daily Load ("TMDL") has been established for the water body;
 - d. The actions the City has taken to trace the source(s) of the illicit discharge;
 - e. Whether the City determined the source(s) of the illicit discharge;
 - f. Whether the illicit discharge has been eliminated, and if so when;
 - g. If the illicit discharge has not been eliminated, the City's plans to eliminate the illicit discharge;
 - h. The entity that eliminated the illicit discharge (i.e., the City or a private entity); and
 - i. How much time elapsed between the notification or identification of the source(s) of the illicit discharge and the elimination of the illicit discharge.

Construction Site Stormwater Runoff Control

7. Section 6.(a)(4)(A)(i) of the MS4 Permit requires the City to develop, implement, and enforce a program to reduce pollutants...from construction activities that result in land disturbance of greater than or equal to one acre (i.e. "Construction Sites"). The City's Construction Site stormwater runoff control plan shall include, but not be limited to, the following elements:

- a. The development and implementation of an ordinance or other regulatory mechanism to require erosion and sediment controls, as well as sanctions for non-compliance;

Describe whether the City has adopted a regulatory mechanism to require sediment and erosion control at Construction Sites.

If the City has adopted a regulatory mechanism to require sediment and erosion control at Construction Sites, provide a copy. If no such regulatory mechanism exists, provide a schedule that explains the process and specifies the date(s) by which the City plans to adopt and enforce such a regulatory mechanism.

- b. Procedures for notifying construction site developers and operators of the requirements for registration under the General Permit for the Discharge of Stormwater and Dewatering Wastewaters Associated with Construction Activities;

Describe the City's procedures for notifying developers and operators of their duty to implement and maintain stormwater control measures;

- c. Procedures for site inspection and enforcement of control measures as well as procedures for site plan review which incorporate consideration of potential water quality impacts;

Describe whether the City has implemented procedures for site plan reviews, inspections, and enforcement of control measures at Construction Sites.

If the City has implemented procedures for site plan reviews, inspections and enforcement of control measures at Construction Sites, provide a written copy of those procedures. A thorough response would include a list of the Construction Sites contributing runoff to the MS4 since May 1, 2010, as well as a list of, and description of, the inspections and enforcement performed by the City for those construction sites. If no such written procedures exist, provide a schedule that explains the process and specifies the date(s) by which the City plans to create and implement such procedures.

Post-Construction Stormwater Management in New Development and Redevelopment

8. Sections 6.(a)(5)(A)(i) - (iv) of the MS4 Permit require the City to develop, implement, and enforce a program to address stormwater runoff from new development and redevelopment projects that disturb greater than or equal to one acre, including projects less than one acre that are part of a larger common plan of development or sale, that discharge into the MS4 or directly to waters of the State ("New Development and Redevelopment"). This program shall include, but not be limited to, the following elements:

- a. Use of an ordinance or other regulatory mechanism to address the elements of post-construction program implementation regarding post-construction runoff from new development and redevelopment projects to the extent allowable under State or local law;

Describe whether the City has adopted a regulatory mechanism to address post-construction runoff from New Development and Redevelopment.

If the City has adopted a regulatory mechanism to address post-construction runoff from New Development and Redevelopment, provide a copy. If no such regulatory mechanism exists, provide a schedule that explains the process and specifies the date(s) by which the City plans to adopt and enforce such a regulatory mechanism.

- b. Develop and implement strategies which include a combination of structural and/or non-structural BMPs referred to in this Request as Stormwater Control Measures and to ensure adequate long-term operation and maintenance of Stormwater Control Measures.

Describe whether the City has implemented procedures to ensure adequate long-term operation and maintenance of Stormwater Control Measures.

If the City has implemented strategies that include Stormwater Control Measures and procedures to ensure adequate long-term operation and maintenance of Stormwater Control Measures, provide a written copy of these strategies and procedures. A thorough response would include a list of the applicable Stormwater Control Measures built since May 1, 2010, and a description of the procedures in place for each. If no such written procedures exist, provide a schedule that explains the process and specifies the date(s) by which the City plans to create and implement such procedures.

Pollution Prevention and Good Housekeeping in Municipal Operations

9. Section 6.(a)(6)(A) of the MS4 Permit requires that the City (i) develop and implement an operation and maintenance program that includes a training

component for municipal employees and contractors and has the ultimate goal of preventing or reducing pollutant runoff from municipal operations; (ii) develop and implement a program to prevent and reduce stormwater pollution from activities such as park and open space maintenance, fleet and building maintenance, new construction and land disturbances, and stormwater system maintenance; and (iii) develop and implement programs to sweep all streets at least once a year as soon as possible after snowmelt and clean catch basins and other stormwater structures that accumulate sediment at least once a year, including a provision to identify and prioritize those structures that may require cleaning more than once a year.

Describe whether the City has (i) implemented a program with a goal of preventing and/or reducing pollutant runoff from municipal operations, (ii) implemented procedures for fleet maintenance, park and open space as well as building maintenance activities, and (iii) develop and implement programs and schedules to street sweep and clean catch basins.

If the City has (i) implemented a program with a goal of preventing and/or reducing pollutant runoff from municipal operations, (ii) implemented procedures for fleet maintenance, park and open space as well as building maintenance activities, and (iii) developed and implement programs for maintenance and building maintenance activities, provide written copies of this program, these procedures, and these schedules. A thorough response to parts (i) and (ii) of this question would include a description of the City's maintenance activities (including schedules for these activities) performed at the Department of Public Works garage and other municipal facilities such as fire and police stations and a schedule for maintenance activities at these locations. If no such programs, procedures, and/or schedules exist, provide a schedule that explains the process and specifies the date(s) by which the City plans to adopt and implement such programs, procedures, and schedules.

10. Section 6.(k) of the MS4 Permit requires that if a Total Maximum Daily Load ("TMDL") is approved for any waterbody into which the permittee discharges stormwater, the permittee shall review its Stormwater Management Plan if the TMDL includes requirements for control of stormwater discharges. Provide a list of all water bodies with approved TMDLs that the City's MS4 discharges into, and whether those TMDLs include requirements for the control of stormwater discharges that apply to the City.

Describe whether the City has reviewed its Stormwater Management Plan to include the stormwater control requirements of the TMDLs associated with water bodies into which MS4 outfalls discharges to.

If the City has not conducted this type of review, provide a schedule that explains the process and specifies the date(s) by which the City plans to address TMDL requirements within its Stormwater Management Plan.

11. Laboratory sampling analysis reports submitted by the City on January 22, 2015 pursuant to the December, 2014 EPA information request demonstrate that concentrations of bacteria, greater than Connecticut's water quality standards (State of Connecticut Regulations Section 22a – 426), were found within the City's MS4.

If the City has not tracked and confirmed the source of the bacteria or any other water quality exceedances in these samples provide a schedule that explains the process and specifies the date(s) by which the City plans to complete these IDDE investigations. EPA recommends the use of the EPA New England Bacterial Source Tracking Protocol (Attachment D) that includes a number of in-field monitoring analysis at appropriate locations in the MS4 to trace the source of the elevated (greater than 0.25 mg/L) ammonia concentrations.

12. The CTDEEP publishes guidelines on best management practices for the disposal of snow accumulations from roadways and parking lots that include the requirement for governmental entities to notify the CTDEEP by email prior to disposing of snow and ice in waterways or, if advance notification is not possible, then the CTDEEP must be contacted as soon as possible after snow disposal has begun. Describe City protocols, and whether the implementation of these protocols adheres to state guidelines and whether the City complied with the guidelines this past winter. If the City's protocols do not align with the CTDEEP recommended guidelines, or if program implementation differs from recommended guidelines, provide a schedule that explains the process and specifies the date(s) by which the City plans to adopt and implement the guidelines.

ATTACHMENT C

Statement of Certification

Complete and Include With Your Response

I declare under penalty of perjury that I am authorized to respond on behalf of the City of West Haven. I certify that the foregoing responses and information submitted were prepared by me, or under my direction or supervision and that I have personal knowledge of all matters set forth in the responses and the accompanying information. I certify that the responses are true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fines and imprisonment.

By _____
(Signature)

(Printed Name)

(Title)

(Date)

ATTACHMENT D

EPA New England Bacterial Source Tracking Protocol

EPA New England Bacterial Source Tracking Protocol

Draft – January 2012

Purpose

This document provides a common framework for EPA New England (“EPA-NE”) staff to develop and implement bacterial source tracking sample events, and provides a recommended approach to watershed association, municipal, and State personnel. Adopted from Boston Water and Sewer Commission (“BWSC”) (2004), Pitt (2004), and based upon fieldwork conducted and data collected by EPA-NE, the protocol relies primarily on visual observations and the use of field test kits and portable instrumentation during dry and wet weather to complete a screening-level investigation of stormwater outfall discharges or flows within the drainage system. When necessary, the addition of more conclusive chemical markers may be included. The protocol is applicable to most typical Municipal Separate Storm Sewer Systems (“MS4s”) and smaller tributary streams. The smaller the upstream catchment area and/or more concentrated the flow, the greater the likelihood of identifying an upstream wastewater source.

Introduction

The protocol is structured into several phases of work that progress through investigation planning and design, laboratory coordination, sample collection, and data evaluation. The protocol involves the concurrent collection and analyses of water samples for surfactants, ammonia, total chlorine, and bacteria. When more precise confirmation regarding the presence or absence of human sanitary sewage is necessary, and laboratory capacity is available, the additional concurrent collection of samples for select Pharmaceutical and Personal Care Product (“PPCP”) analysis is advised. When presented with a medium to large watershed or numerous stormwater outfalls, the recommended protocol is the screening of all outfalls using the surfactant, ammonia, total chlorine, and bacterial analyses, in addition to a thorough visual assessment. The resulting data and information should then be used to prioritize and sample a subset of outfalls for all parameters, including PPCP compounds and additional analyses as appropriate. Ideally, screening-level analyses can be conducted by state, municipal, or local watershed association personnel, and a prioritized sub-set of outfalls can be sampled through a commercial laboratory or by EPA-NE using more advanced confirmatory techniques.

Step I – Reconnaissance and Investigation Design

Each sample event should be designed to answer a specific problem statement and work to identify the source of contamination. Any relevant data or reports from State, municipal, or local watershed associations should be reviewed when selecting sample locations. Aerial photography, mapping services, or satellite imagery resources are available free to the public through the internet, and offer an ideal way to pre-select locations for either field verification or sampling.

Sample locations should be selected to segregate outfall sub-catchment areas or surface waters into meaningful sections. A common investigative approach would be the identification of a specific reach of a surface water body that is known to be impaired for bacteria. Within this

specific reach, stormwater outfalls and smaller tributary streams would be identified by desktop reconnaissance, municipal outfall mapping, and field investigation when necessary. Priority outfalls or areas to field verify the presence of outfalls should be selected based on a number of factors, including but not limited to the following: those areas with direct discharges to critical or impaired waters (e.g. water supplies, swimming beaches); areas served by common/twin-invert manholes or underdrains; areas with inadequate levels of sanitary sewer service, Sanitary Sewer Overflows (“SSOs”) or the subject of numerous/chronic sanitary sewer customer complaints; formerly combined sewer areas that have been separated; culverted streams, and; outfalls in densely populated areas with older infrastructure. Pitt (2004) provides additional detailed guidance.

When investigating an area for the first time, the examination of outfalls in dry-weather is recommended to identify those with dry-weather flow, odor, and the presence of white or gray filamentous bacterial growth that is common (but not exclusively present) in outfalls contaminated with sanitary sewage (see Attachment 1 for examples). For those outfalls with dry-weather flow and no obvious signs of contamination, one should never assume the discharge is uncontaminated. Sampling by EPA-NE staff has identified a number of outfalls with clear, odorless discharges that upon sampling and analyses were quite contaminated. Local physical and chemical conditions, in addition to the numerous causes of illicit discharges, create outfall discharges that can be quite variable in appearance. Outfalls with no dry-weather flow should be documented, and examined for staining or the presence of any obvious signs of past wastewater discharges downstream of the outfall.

As discussed in BWSC (2004), the protocol may be used to sample discreet portions of an MS4 sub-catchment area by collecting samples from selected junction manholes within the stormwater system. This protocol expands on the BWSC process and recommends the concurrent collection of bacteria, surfactant, ammonia, and chlorine samples at each location to better identify and prioritize contributing sources of illicit discharges, and the collection of PPCP compounds when more conclusive source identification is necessary.

Finally, as discussed further in Step IV, application of this sampling protocol in wet-weather is recommended for most outfalls, as wet-weather sampling data may indicate a number of illicit discharge situations that may not be identified in dry weather.

Step II – Laboratory Coordination

All sampling should be conducted in accordance with a Quality Assurance Project Plan (“QAPP”). A model QAPP is included as Attachment 2. While the QAPP details sample collection, preservation, and quality control requirements, detailed coordination with the appropriate laboratory staff will be necessary. Often sample events will need to be scheduled well in advance. In addition, the sampling team must be aware of the strict holding time requirements for bacterial samples – typically samples analysis must begin within 6 hours of sample collection. For sample analyses conducted by a commercial laboratory, appropriate coordination must occur to determine each facilities respective procedures and requirements. The recommendations in this protocol are based on the use of a currently unpublished EPA-NE

modification to *EPA Method 1694 – Pharmaceuticals and Personal Care Products in Water, Soil, Sediment, and Biosolids by HPLC/MS/MS*. Several commercial laboratories may offer Method 1694 capability. EPA-NE recommends those entities wishing to utilize a contract laboratory for PPCP analyses ensure that the laboratory will provide quantitative analyses for acetaminophen, caffeine, cotinine, carbamazepine, and 1,7-dimethylexanthine, at Reporting Limits similar to those used by EPA-NE (See Attachment 3). Currently, the EPA-NE laboratory has limited capacity for PPCP sampling, and any proposed EPA-NE PPCP sample events must be coordinated well in advance with the appropriate staff.

Step III – Sample Collection

Once a targeted set of outfalls has been selected, concurrent sampling and analyses for surfactants, ammonia, and total chlorine (which can all be done through the use of field kits), in addition to bacteria (via laboratory analysis) should be conducted. When numerous outfalls with dry-weather flow exist, sample locations should be prioritized according to the criteria mentioned above. In addition, field screening using only the field kits may occur during the field reconnaissance. However, it must be emphasized that the concurrent sampling and analyses of bacteria, surfactant, ammonia, and total chlorine parameters is the most efficient and cost-effective screening method.

When first observed, the physical attributes of each outfall or sampling location should be noted for construction materials, size, flow volume, odor, and all other characteristics listed on the data collection form (Attachment 4). In addition, GPS coordinates should be collected and a photograph of the sample location taken. Whenever possible, the sampling of storm drain outfalls should be conducted as close to the outfall opening as possible. Bacterial samples should be collected first, with care to not disturb sediment materials or collect surface debris/scum as best possible. A separate bottle is used to collect a single water sample from which aliquots will be analyzed for surfactants, ammonia, and total chlorine. A sample for PPCP analysis is recommended to be collected last, as the larger volume required and larger bottle size may cause some sediment disturbance in smaller outfalls or streams. If necessary, a second smaller, sterile and pre-cleaned sampling bottle may be used to collect the surface water which can then be poured into the larger PPCP bottle. Last, a properly calibrated temperature/specific conductance/salinity meter should be used to record all three parameters directly from the stream or outfall. When flow volume or depth is insufficient to immerse the meter probe, a clean sample bottle may be utilized to collect a sufficient volume of water to immerse the probe. In such instances, meter readings should be taken immediately.

As soon as reasonably possible, sample aliquots from the field kit bottle should be analyzed. When concurrent analyses are not possible, ammonia and chlorine samples should be processed first, followed by surfactant analysis, according to each respective Standard Operating Procedure as appropriate based on the particular brand and type of field test kit being used. All waste from the field test kits should be retained and disposed of according to manufacture instructions. Where waste disposal issues would otherwise limit the use of field kits, EPA-NE recommends that, at a minimum, ammonia test strips with a Reporting Limit below 0.5 mg/L be utilized. Such test strips typically are inexpensive and have no liquid reagents associated with their use.

Results should be recorded, samples placed in a cooler on ice, and staff should proceed to the next sample location.

Upon completion of sampling and return to the laboratory, all samples will be turned over to the appropriate sample custodian(s) and accompanied by an appropriate Chain-of-Custody ("COC") form.

Step IV – Data Evaluation

Bacterial results should be compared to the applicable water quality standards. Surfactant and ammonia concentrations should be compared to the thresholds listed in Table 1. Evaluation of the data should include a review for potential positive results due to sources other than human wastewater, and for false negative results due to chemical action or interferences. In the EPA-NE region, field sampling has indicated that the biological breakdown of organic material in historically filled tidal wetlands may cause elevated ammonia readings, as can the discharge from many landfills. In addition, salinity levels greater than 1 part per thousand may cause elevated surfactant readings, the presence of oil may likewise indicate elevated levels, and fine suspended particulate matter may cause inconclusive surfactant readings (for example, the indicator ampule may turn green instead of a shade of blue). Finally, elevated chlorine from leaking drinking water infrastructure or contained in the illicit wastewater discharge may inhibit bacterial growth and cause very low bacterial concentrations. Any detection of total chlorine above the instrument Reporting Limit should be noted.

Table 1 – Freshwater Water Quality Criteria, Threshold Levels, and Example Instrumentation ¹

Analyte/ Indicator	Threshold Levels/ Single Sample ³	Instrumentation
E. coli ²	235 cfu/100ml	Laboratory via approved method
Enterococci ²	61 cfu/100ml	Laboratory via approved method
Surfactants (as MBAS)	≥ 0.25 mg/l	MBAS Test Kit (e.g. CHEMetrics K-9400)
Ammonia (NH ₃)	≥ 0.5 mg/l	Ammonia Test Strips (e.g. Hach brand)
Chlorine	> Reporting Limit	Field Meter (e.g. Hach Pocket Colorimeter II)
Temperature	See Respective State Regulations	Temperature/Conductivity/Salinity Meter (e.g. YSI Model 30)

¹ The mention of trade names or commercial products does not constitute endorsement or recommendation for use by the U.S. EPA

² 314 CMR 4.00 MA - Surface Water Quality Standards - Class B Waters.

³ Levels that may be indicative of potential wastewater or washwater contamination

Once dry-weather data has been examined and compared to the appropriate threshold values, outfalls or more discreet reaches of surface water can be selected for sampling or further

investigation. Wet-weather sampling is also recommended for all outfalls, in particular for those that did not have flow in dry weather or those with dry-weather flow that passed screening thresholds. Wet-weather sampling will identify a number of situations that would otherwise pass unnoticed in dry weather. These wet-weather situations include, but are not limited to the following: elevated groundwater that can now cause an exchange of wastewater between cracked or broken sanitary sewers, failed septic systems, underdrains, and storm drains; increased sewer volume that can exfiltrate through cracks in the sanitary piping; increased sewer volume that can enter the storm drain system in common manholes or directly-piped connections to storm drains; areas subject to capacity-related SSO discharges, and; illicit connections that are not carried through the storm drain system in dry-weather.

Step V – Costs

Use of field test kits and field instruments for a majority of the analytical parameters allows for a significantly reduced analytical cost. Estimated instrument costs and pro-rated costs per 100 samples are included in Table 2. The cost per 100 samples metric allows averaged costs to account for reagent refills that are typically less expensive as they do not include the instrument cost, and to average out the initial capital cost for an instrument such as a temperature/conductivity/salinity meter. For such capital costs as the meters, the cost over time will continue to decrease.

Table 2 – Estimated Field Screening Analytical Costs ¹

Analyte/ Indicator	Instrument or Meter ²	Instrument or Meter Cost/No. of Samples	Cost per Sample (Based on 100 Samples) ³
Surfactants (as MBAS)	Chemetrics K- 9400	\$77.35/20 samples (\$58.08/20 sample refill)	\$3.09
Ammonia (NH ₃)	Hach brand 0 – 6 mg/l	\$18.59/25 samples	\$0.74
Total Chlorine	Hach Pocket Colorimeter II	\$389/100 samples (\$21.89 per 100 sample refill)	\$3.89
Temperature/ Conductivity/ Salinity	YSI	\$490 (meter and cable probe)	\$4.90

¹ Estimated costs as of February 2011

² The mention of trade names or commercial products does not constitute endorsement or recommendation for use by the U.S. EPA

³ One-time meter costs and/or refill kits will reduce sample costs over time

From Table 2, the field analytical cost is approximately \$13 per outfall. Typical bacterial analyses costs can vary depending on the analyte, method, and total number of samples to be performed by the laboratory. These bacterial analyses costs can range from \$20 to \$60. Therefore, the analytical cost for a single outfall, based on the cost per 100 samples, ranges from

\$33 to \$73. As indicated above, these costs will decrease slightly over time due to one-time capitals costs for the chlorine and temperature/conductivity/salinity meters.

Step VI – Follow-Up

Once all laboratory data has been reviewed and determined final in accordance with appropriate quality assurance controls, results should be reviewed with appropriate stakeholders to determine next steps. Those outfalls or surface water segments that fail to meet the appropriate water quality standard, and meet or exceed the surfactant and ammonia threshold values, in the absence of potential interferences mentioned in Step IV, indicate a high likelihood for the presence of illicit connections upstream in the drainage system or surface water. Whereas illicit discharges are quite variable in nature, the exceedance of the applicable water quality standard and only the ammonia or surfactant threshold value may well indicate the presence of an illicit connection. When available, the concurrent collection and analyses of PPCP data can greatly assist in confirming the presence of human wastewater. However, such data will not be available in all instances, and the collective data set and information regarding the physical characteristics of each sub-catchment or surface water reach should be used to prioritize outfalls for further investigation. As warranted, data may be released to the appropriate stakeholders, and should be accompanied by an explanation of preliminary findings. Release of EPA data should be fully discussed with the case team or other appropriate EPA staff.

References Cited

Boston Water & Sewer Commission, 2004, *A systematic Methodology for the Identification and Remediation of Illegal Connections*. 2003 Stormwater Management Report, chap. 2.1.

Pitt, R. 2004 *Methods for Detection of Inappropriate Discharge to Storm Drain Systems*. Internal Project Files. Tuscaloosa, AL, in The Center for Watershed Protection and Pitt, R., *Illicit Discharge Detection and Elimination: A Guidance Manual for Program Development and Technical Assessments*: Cooperative Agreement X82907801-0, U.S. Environmental Protection Agency, variously paged. Available at: <http://www.cwp.org>.

Instrumentation Cited (Manufacturer URLs)

MBAS Test Kit - CHEMetrics K-9400: <http://www.chemetrics.com/Products/Deterg.htm>

Portable Colorimeter – Hach Pocket Colorimeter II: <http://www.hach.com/>

Ammonia (Nitrogen) Test Strips: <http://www.hach.com/>

Portable Temperature/Conductivity/Salinity Meter: YSI Model 30:
<http://www.ysi.com/productsdetail.php?30-28>

Disclaimer: *The mention of trade names or commercial products in this protocol does not constitute endorsement or recommendation for use by the U.S. EPA.*